

Glenn Research Center, Environmental Programs Manual

Chapter 20 - UNDERGROUND STORAGE TANKS (UST)

NOTE: The current version of this Chapter is maintained and approved by the Safety, Health and Environmental Division (**SHED**). The last revision date of this chapter is January 2006. If you are referencing paper copies, please verify that it is the most current version before use. The current version is maintained on the Glenn Research Center intranet at <http://smad-ext.grc.nasa.gov/shed/pub/epm/epm-manual.pdf>. Approved by: Environmental Management Branch Chief, Priscilla Mobley.

PURPOSE

This chapter sets forth Glenn Research Center (GRC) policies and requirements for the design, construction and operation, as well as maintenance, monitoring and reporting for underground petroleum storage tanks. The provisions herein are in accord with the national effort to comply with mandated regulations. This chapter conforms to the GRC EMS as defined in this Manual's Chapter 1 and supports GRC Environmental Policy, promoting pollution prevention, regulatory compliance, and continuous improvement. Following the guidelines in this chapter will assist GRC in achieving regulatory compliance objectives and targets. Achievement of these objectives and targets can be tracked through the audit results and CPAR records.

APPLICABILITY

This chapter is applicable to all GRC personnel affiliated with the underground petroleum storage tanks at Lewis Field (LF) and at Plum Brook Station (PBS).

REGULATIONS, REGULATORS, and STANDARDS

The following are the authorities that presently regulate UST's at GRC. They are incorporated here by reference. The complete regulatory text should be consulted for details.

U.S. Environmental Protection Agency: Office of Underground Storage Tanks (OUST)

- Resource Conservation and Recovery Act, Subtitle I, Subchapter IX – Regulation of USTs
- Energy Policy Act of 2005 – Subtitle B, Sections 1521 through 1530
- Federal UST Compliance Act, amends 9004 and 9005 of the Solid Waste Disposal Act (42 U.S.C. 6991c)

Code of Federal Regulations: 40 CFR Part 280

- Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks.

Ohio Department of Commerce: Bureau of Underground Storage Tank Regulations (BUSTR)

- Delegated authority on USTs that store petroleum product, from installation to releases and tank closure.
- Chapters 1301:7-9-01 through 1301:7-9-17 of the Ohio Administrative Code. March 2005.
- Chapter 1301:7-7-28 Flammable and Combustible Liquids

Ohio Revised Code: Title 37 Health, Safety, and Morals

- Chapter 3737 - Fire Marshall, Fire Safety, Petroleum USTs as amended.

Ohio Environmental Protection Agency (OEPA)

- Ohio Underground Storage Tanks are Regulated by BUSTR

American National Standard Institute (ANSI)

- ANSI B31.3-2002 Standard Code for Pressure Piping

American Petroleum Institute (API)

- API 1604-1996 Closure of Underground Petroleum Storage Tanks
- API 1615-2001 Installation of Underground Petroleum Storage Tanks
- API 1626-2000 Storing and Handling Ethanol and Gasoline-ethanol Blends at Distribution Terminals and Service Stations.
- API 1627-2000 Storage and Handling of gasoline-methanol/Consolvent Blends at Distribution Terminals and Service Stations.

- API 1631-2001 Interior Lining and Periodic Inspection of Underground Storage Tanks
- API 1632-2002 Cathodic Protection of Underground Petroleum Storage tanks and Piping Systems.

National Fire Protection Association (NFPA)

- NFPA 30-2003 Flammable and Combustible Liquids Code
- NFPA 30A-2003 Motor Fuel Dispensing Facilities and Repair Garages
- NFPA 407-2001 Standard for Aircraft Fuel Servicing

Steel Tank Institute (STI)

- STI-R892 Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems.
- STI-F894 Specifications for External Corrosion Protection of Fiberglass Reinforced Plastic (FRP) Composite Steel Underground Storage Tanks.

Underwriters Laboratories (UL)

- UL 567-2003 Pipe Connectors for Petroleum Products and LP gas
- UL 971-1995 Nonmetallic Underground Piping for Flammable Liquids
- UL 1316-1994 Standard for Glass-Reinforced Plastic Underground Storage Tanks for Petroleum Products.

RESPONSIBILITIES

Environmental Management Branch (EMB)

- Prepares and submits the annual UST registration of the Lewis Field and PBS underground storage tank inventory to BUSTR. (Annually by the 1st of July).
- Following the above listed regulations and standards, implements, maintains and monitors the UST inventory program at Lewis Field. This includes all permits submitted for major repairs, modifications, and/or upgrades to the UST systems, as well as reporting of releases of twenty-five gallons or more to the environment at Lewis Field.
- Responds to regulatory requests for information concerning the environmental aspects of the UST program at Lewis Field and Plum Brook Station.
- Prepares notifications and reports required by the NASA GRC Spill Prevention, Control, and Countermeasures Plan (SPCC) at Lewis Field and the integrated Contingency Plan at Plum Brook Station.
- Serves as primary point of contact for regulatory agencies regarding USTs at Lewis Field and Plum Brook Station.
- Inspects the release detection equipment monthly and obtains leak detection reports from all Veeder Root monitoring systems at Lewis Field.
- Conducts monthly reconciliation of fuel delivery and usage for all UST systems at Lewis Field.
- Will coordinate training for operators of UST systems at Lewis Field and Plum Brook Station.
- Issues the Work Order Requests for the purging of uncontaminated ground water and precipitation from UST sumps.

Facilities Division (FD)

- Designs and constructs underground storage facilities in accordance with requirements and standards prescribed by the Ohio State Fire Marshal.
- Provides EMB and PBS with information necessary for the preparation of any permits necessary for the removal, installation, and operation of USTs.
- Maintains the project file for the design and construction of UST projects. EMB maintains the official file of any permits and correspondence.
- Operates and maintains underground storage tank systems at Buildings 12 and 500, in conformance with the standards and requirements prescribed by the authorities and standards listed above.

Logistics and Technical Information Division (LTID) (SGT)

- Maintains daily records of fuel usage, delivery, and consumption at Lewis Field.
- Conducts the ordering and delivery of fuels to all UST systems at Lewis Field, except for those located at Buildings 12 and 500.
- Reports known or suspected releases immediately to the Glenn Dispatcher at 911 and then to EMB as specified in the GRC Emergency Preparedness Plan.

Manthia Technologies Incorporated (MTI) at Lewis Field only.

- On a contractual basis with the operator/owner of the tank, may conduct routine maintenance and normal operational upkeep of the UST systems and related release detection components based on the tank manufactures recommendations.
- If contracted to conduct any repairs, modifications, or upgrades to any of the UST systems requiring the presence of a Certified UST Installer and when no release to the environment has occurred, will coordinate with EMB in having a Certified UST Installer present.
- If contracted to conduct any repairs, modifications, or upgrades to an UST system when a release to the environment has occurred or the integrity of the UST system has been compromised, will coordinate with EMB in having a Certified UST Installer and Certified UST Inspector on site during the procedure.
- Maintains reports of repairs, modifications, and upgrades conducted on UST systems for the life of those systems.

Waste Management (WM) at Lewis Field Only

- Coordinates the removal and disposal of groundwater infiltration into the piping sumps at Buildings 102 and 131.
- Coordinates the remediation of contaminated water or soil with the responsible party of the UST system.
- Assists in the characterization and disposal of fuels/oils in oil separator pits, oil skimming operations, and sludge removal operations.

Plum Brook Management Office (PBMO)

- Following the referenced regulations and standards, implements, maintains, and monitors the UST inventory program at Plum Brook Station. This includes all permits submitted for major repairs, modifications, and/or upgrades to the UST systems, as well as reporting of releases of twenty-five gallons or more to the environment.
- Assures the proper and accurate auditing of inventory and monitoring of tank conditions performed by PBMO staff or its contractors.
- Reports suspected leaks to the Glenn Environmental Management Branch, specifically, the PBS Environmental Manager at 4-3234.
- Conducts monthly reconciliation of fuel delivery and usage for all UST systems at Plum Brook Station.

General Operator Requirements of UST Systems at Lewis Field and Plum Brook Station

- Shall have a designee on-site and supervising all fuel deliveries into their systems.
- Shall visually inspect all spill prevention equipment after each delivery and promptly have any water, regulated substance, or debris removed and properly disposed of.
- At Lewis Field, one shall contact the First Responders by calling 911 on an internal phone or (216) 433-8888 on an external phone in the event of any spill or suspected releases.
- At PBS, one shall contact the PBS Environmental Manager at 4-3234 in the event of any spill or suspected release.
- Shall contact EMB for all Veeder Root Systems in alarm and signs of inconsistencies in product consumption.
- Shall immediately cease use of the UST system until release detection methods have been inspected and verified to be operating properly by an independent third party that meets the requirements of rule 1301:7-9-11 of the Ohio Administrative Code.
- Shall annually inspect and verify the proper operation of all UST system components, containments, and release detection methods by an independent third party that meets the requirements of rule 1301:7-9-11 of the Ohio Administrative Code.
- These general operating requirements should by no means be considered the entirety of the other referenced regulations and standards which should be consulted for further details not listed here.

DEFINITIONS

Abandonment: Permanently taking an UST system out of service for more than twelve (12) months but not out of the ground

Ancillary Equipment: Any device including, without limitation, such devices as piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of regulated substances to and from an UST.

Certified Installer: Individual certified by the fire marshal under the requirements of rule 1301:7-9-11 of the Ohio Administrative Code to supervise the installation of, performance of major repairs on site to, closure-in-place of,

removal of, performance of modifications of, placing out-of-service for more than ninety days of, change in service of or the performance of evaluations of leak detection equipment on UST systems.

Certified UST Inspector: Individual certified by the fire marshal under the requirements of the rule 1301-7-9-11 of the Ohio Administrative Code to inspect the installation of, performance of major repairs on site to, closure-in-place of, removal of, performance of modifications of, placing out-of-service for more than ninety days of, change in service of or the performance of evaluations of leak detection equipment on UST systems.

Change-In-Service: A change in the substances managed in the UST system from regulated substances to non-regulated substances, without closure in place or permanent removal of the UST System.

Closure-in-Place: The abandonment of an UST system by permanently taking the UST out-of-service but not out of the ground in compliance with 1301:7-9-02 of the Ohio Administrative Code.

Compatible: The ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the UST system under conditions likely to be encountered in the UST.

Connected Piping: All underground piping that includes valves, elbows, joints, flanges, and flexible connectors attached to an UST system through which regulated substances flow.

Corrective Action: Any action necessary to protect human health and the environment in the event of a release of petroleum into the environment, including without limitation, any action necessary to monitor, assess, and evaluate the release.

Free Product: A separate liquid hydrocarbon phase that has a measured thickness of greater than one one-hundredth of a foot.

Hazardous Substance: Any substance listed in Rule 1301:7-9-03 of the Ohio Administrative Code, but not including any substance regulated as a hazardous substance hazardous waste under chapters 3745-50 to 3745-69 of the Ohio Revised Code, or any mixture of such substance and petroleum which is not contained in a petroleum UST System.

Heating Fuel: Petroleum that is Number 1, 2, 4-Light, 4-Heavy, 5-Light, 5-Heavy, and Number 6 technical grades of fuel oil. Typically used in the operation of heating equipment, boilers, or furnaces.

Hydraulic Lift Tank: Tanks holding hydraulic fluid for a closed-loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar equipment.

Maintenance: Means the normal operational upkeep to prevent an underground storage tank system from releasing product.

Major Repair: The restoration, upgrading, or modification of a tank or an underground storage tank system component that has caused a release of a product from the underground storage tank system. It does not include routine maintenance or normal operational upkeep to prevent an underground storage tank system from releasing a product.

Modification: Work performed on a UST System component that has not leaked such as adding, altering or retrofitting the following:

- a. USTs and any components fixed to UST openings;
- b. Containments located over USTs, under dispensers or a intermediate points excluding spill prevention equipment;
- c. Piping components that routinely contain regulated substances up to and including shear valves at the dispenser;
- d. Underground vent lines excluding stage two vapor recovery components;
- e. Flexible connector lines;
- f. UST lining components; and
- g. Release detection equipment;

Motor Fuel: Petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, or any grade of gasoline, and is typically used in the operation of a motor engine.

Operational Life: The period beginning when installation of the UST system has commenced until the time the UST is properly closed under 1301:7-9-02 of the Administrative Code.

Operator: The person in daily control of, or having responsibility for the daily operation of the UST System.

Petroleum: Includes crude oil or any fraction thereof that is a liquid at the temperature of sixty degrees Fahrenheit and the pressure of fourteen and seven-tenths pounds per square inch absolute. It includes, without limitation, motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Regulated Substance: Any hazardous substance, and, or petroleum product.

Release: Any spilling, leaking, emitting, discharging, escaping, leaching or disposing of a petroleum product from an UST system into ground water, a surface water body, and sub-surface soils or otherwise into the environment.

Release of a Hazardous Substance: Same as a Release, or

- a. Any spilling, leaking, emitting, discharging, escaping, or disposing of a hazardous substance into ground water, surface water body, subsurface soils or otherwise in to the environment while transferring or attempting to transfer a hazardous substance into an UST system, or
- b. Contamination of subsurface soils or ground water on the UST site by a hazardous substance found and confirmed through laboratory analysis from the UST.

Repair: To restore a tank or UST system component that has caused a release of product from the UST system.

Routine Maintenance or Normal Operational Upkeep: Work performed to maintain or to prevent an UST system from releasing a regulated substance. Work on the following components shall constitute routine maintenance or normal operational upkeep on existing UST systems provided that the component has not caused a leak:

- a. Drop Tubes
- b. Overfill containment devices;
- c. Spill prevention equipment;
- d. Fill caps and adapters;
- e. Cathodic protection components;
- f. Stage one vapor recovery components;
- g. Submersible pump components provided that no product lines are disconnected; and
- h. Individual leak detection monitoring units, probes, sensors or line leak detectors that are maintained with like components.

Spill: A release resulting from improper dispensing practices to an UST system including, without limitation, the disconnecting of a delivery hose from a tank's fill pipe before the hose has drained completely.

Spill Prevention Equipment: Spill containment manhole or spill bucket installed at a fill pipe that catches and holds drips and spills of regulated substances that can occur when a delivery hose is removed from the fill pipe after delivery of a regulated substance to an UST.

Suspected Release of a Hazardous Substance: Evidence of a release of a hazardous substance obtained through one or more of the following events:

- a. The monitoring results from release detection method shows that a release of a hazardous substance may have occurred unless:
 - i. The monitoring device is found to be defective, and is immediately recalibrated or replaced, and additional monitoring does not confirm the initial results.
 - ii. In the case of inventory control, a second month of data does not confirm the initial result.
- b. Unusual operating conditions observed by the owners and operators unless system equipment is found to be defective but not leaking, and is immediately repaired or replaced.
- c. Presence of free hazardous substance discovered during the removal of an UST system or part thereof in an excavation on the UST site or on property nearby the UST site.
- d. The discovery of hazardous substance vapors within or along building foundations or other subsurface manmade structures.
- e. The presence of free hazardous substance in a monitoring or an observation well located on the UST site or on property nearby the UST site; or
- f. The presence of hazardous substance observed on a surface water body located on the UST site or on property nearby the UST site suspected to have arisen from a release from an UST system.
- g. The presence of free hazardous substance discovered in an UST secondary containment system on the UST site.

Temporarily Out-Of-Service: Normal operation and use of the UST system is deliberately, but temporarily, discontinued for ninety (90) days or less.

Upgrade: The addition or retrofit of some system such as a cathodic protection, lining, or spill and overfill controls to improve the ability of an UST to prevent the release of product.

Underground Storage Tank: One or any combination of tank, including the underground piping connected thereto, that are used to contain an accumulation of regulated substances the volume of which, including the volume of the underground pipes connected thereto, is ten (10) percent or more beneath the surface of the ground. The term does not include any of the following:

- a. Tanks used for storing heating fuel for consumptive use on the premise where stored;
- b. Surface impoundments, pits, ponds, or lagoons;
- c. Storm or waste water collection systems ;
- d. Flow-through process tanks;
- e. Storage tanks located in underground areas, including without limitation, basements, cellars, mine workings, drifts, shafts, or tunnels, when the tanks are located on or above the surface of the floor;
- f. Septic tanks; or
- g. Liquid traps or associated gathering lines directly related to oil or gas production and gathering questions.

Underground Storage Tank System: An UST and the connected underground piping, underground ancillary equipment, and containment system, if any.

RECORDS

Environmental Management Branch

- UST Permits for Lewis Field and Plum Brook Station.
- Closure Reports for Lewis Field and Plum Brook Station.
- Annual BUSTR Registrations for Lewis Field and Plum Brook Station.
- Records of repairs, modifications, replacements, inspections, and tank testing for Lewis Field.
- Notification reports to regulators of known and suspected releases of regulated substances for Lewis Field.
- Spill Prevention Control and Countermeasure (SPCC) Spill Reports for Lewis Field.
- Veeder Root 30-Day Interstitial Monitoring and Reconciliation Reports for Lewis Field.
- Training Attendance Sheets

Facilities Division

- Records of repairs, modifications, replacements of UST system components located at Buildings 12 and 500.

LTID

- Records of fuel usage, deliveries and consumption at Lewis Field and Plum Brook Station.

Manthia Technologies Incorporated (MTI) at Lewis Field Only

- Records of normal operational maintenance conducted on UST systems.
- Records of repairs, modifications, and replacements of UST system components.

Plum Brook Management Office at Plum Brook Station Only

- Records of manual tank gauging, fuel usage, deliveries and consumption.
- Records of normal operational maintenance of UST systems.
- Records of repairs, modifications, and replacements of UST system components
- Records of UST closures or close-in-place statuses.

Safety and Mission Assurance Directorate ([SMAD](#))

Safety, Health and Environmental Division ([SHED](#))

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